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(54) Composite end closure member for composite container

(57) A container has both its body and its bottom end closure made from composite material. The body comprises at least one outer cardboard layer 5, a metallic barrier foil 6 internally covering the same, an inner sealable plastic covering 7, and preferably an outer plastics covering 8 and the bottom closure, which is fitted following the introduction of the charge, comprises a cardboard layer 9, a metallic barrier foil 10 applied to the inside thereof and an inwardly positioned, sealable plastic covering 11, the bottom being sealed to the body by inductive high frequency. The cardboard layer of the bottom closure is preferably externally printed, eg with a metallic ink, and is protected by varnish. The bottom closure has a U-shaped rim which receives the bottom end of the body, the closure being sealed both to the inside and the outside of the body. Preferably the outer limb of the rim is bent inwards towards the body (Figure 2). The top closure may be constructed as a membrane closure with a snap cover or may be of the same construction as the bottom closure and provided with a breaking line for forming a reclosable flap (Figure 4). The body may be of circular or non-circular cross section, made by spirally or longitudinally winding the composite material. Sealing by inductive high frequency is possible because the metallic barrier foil 10 is adjacent the plastics coverings 11, 7 and 8.

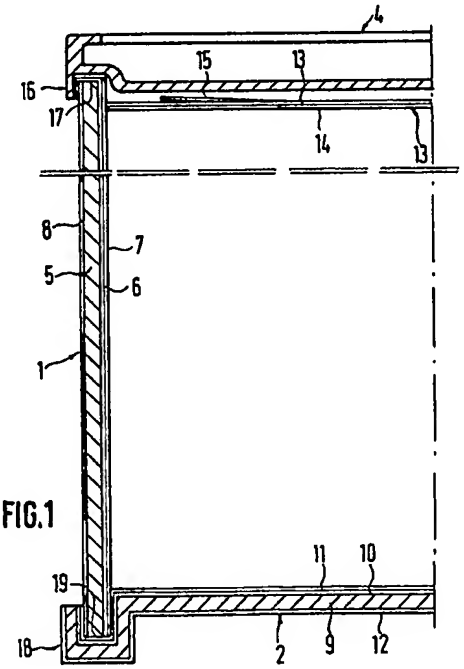

FIG.1

The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

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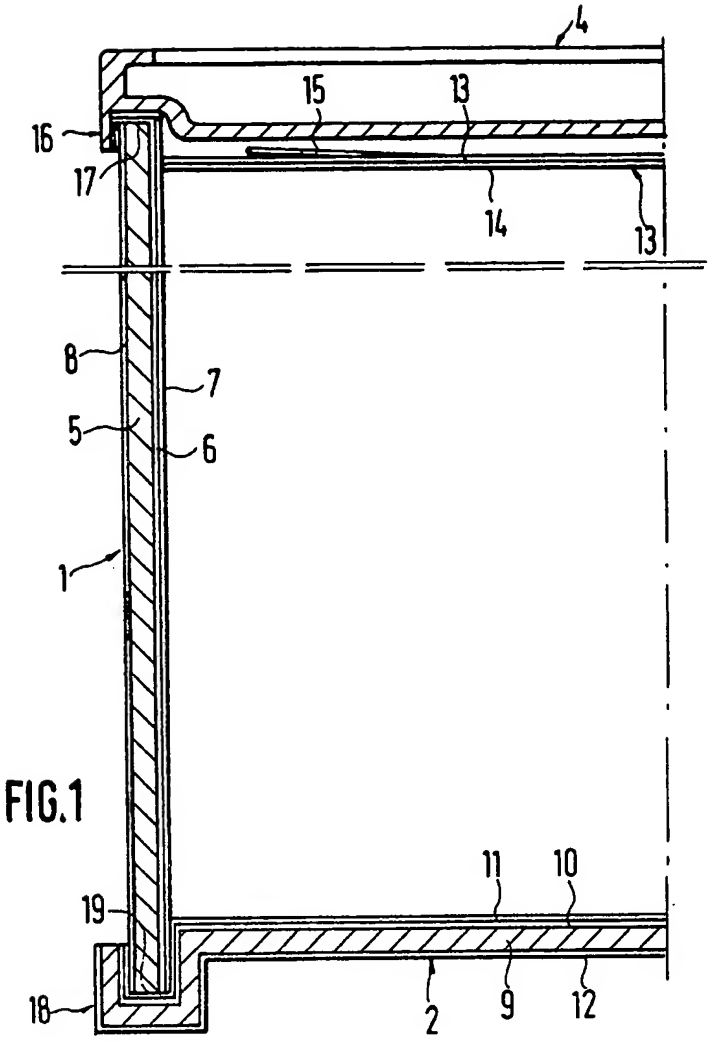


FIG.1

FIG.2

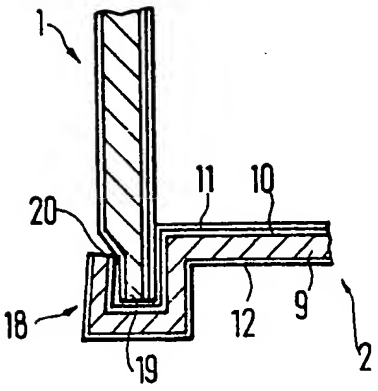


FIG.3

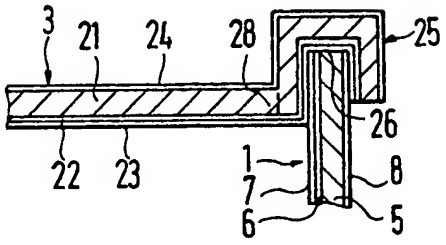
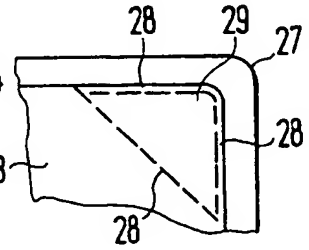


FIG.4



SPECIFICATION

Composite end closure member for composite container

The invention relates to a combination container made from composite material, whose body comprises at least one outer cardboard layer, a barrier foil, e.g. of aluminium, covering the same on the inside and an inner, sealable plastic covering, whose closure comprises an optionally tear-off layer with an inner, sealable plastic covering and whose deep-drawn bottom to be fitted following the introduction of the charge comprises at least one cardboard layer, a metal barrier foil and a sealable plastic covering placed on the inside, the bottom with its rim being drawn upwards and outwards over the end face of the body and is sealed on the inside and outside to said body.

Combination containers of the aforementioned construction have acquired particular significance in connection with the packaging of foods, because they are less expensive than conventional metal tin cans. The liquid and gas tightness, as well as the water vapour diffusion tightness of such combination containers is mainly achieved through the generally metallic barrier foils, but leads to problems in the vicinity of the connections between the closure and bottom to the body. This seal is obtained by sealing by means of the plastic coverings. In practice, it is known to merely insert the deep-drawn composite cardboard bottom flush into the body. This has the disadvantage that the cutting edge of the body is open, so that moisture can penetrate into the composite cardboard of the body and swell the latter. Instead of this, it has already been proposed to cover the cutting edge of the body in that the deep-drawn bottom with its rim terminates flush with the outer circumferential surface of the body. However, the bottom must be extremely true to size, so that the rim does not project to the outside, thus permitting the easy raising thereof. This true to size requirement can often not be satisfied, because the body is not absolutely circular. This is even more critical in the case of non-circular containers having e.g. a rectangular cross-section with rounded corners. Finally, it has already been proposed to construct the body somewhat longer than necessary and to flange round the deep-drawn, inwardly inserted bottom. However, this process involves a high material consumption, is costly and in the case of thick walls and particularly non/ circular containers leads to an unattractive appearance and in particular to folding. This folding is virtually unavoidable in the case of non-circular containers, where this type of bottom fixing is not usable.

Therefore all the aforementioned attempts failed to lead to a completely satisfactory solution. This is the reason why the bottom is still mainly made from deep-drawn tin plate and the latter is edge flanged onto the body after introducing the filling material or charge.

In the case of the aforementioned known combination container (U.S. Patent 3 434 651), the tin plate bottom is admittedly replaced by a composite cardboard bottom, but this construction requires a hot sealing of the bottom to the body. Due to the necessary heat transfer, which takes a certain amount of time before the plastic covering reaches its melting temperature, it is not possible for such a combination container to compete with the hitherto known containers having a tin plate bottom, because the machine cycle times are much too long. In other words the price advantage of the composite cardboard bottom compared with a tin plate bottom is lost as a result the more time-consuming sealing thereof.

The same applies with regards to another known construction (German patent 11 63 130), in which initially an externally plastic-covered aluminium moulding with a downwardly bent rim is inserted in the container body and subsequently a composite cardboard part with an internal plastic covering is fitted and its edge or rim is externally shaped over the circumferential surface of the body. Hereagain, hot sealing takes place between the aluminium closure part and the inside of the container rim, as well as between its outside and the inside of the rim of the composite cardboard part. As in this case the heat is exclusively supplied from the outside, even less favourable cycle times for closing the container are obtained. The two-part construction and the two-stage application of the closure constitutes further disadvantages.

The problem of the present invention, in the case of a combination container is to replace the conventional tin plate bottom by a less expensive bottom, which has the same effect from the optical standpoint and whilst obtaining identical closure cycle times.

On the basis of the aforementioned combination container, this problem is solved in that the metallic barrier foil of the bottom is placed on the inside of the cardboard layer and is internally provided with a plastic covering, whilst the bottom is sealed to the body by inductive high frequency.

As a result of the use of the inductive high frequency process, it is possible to obtain substantially the same cycle times as when edge flanging conventional tin plate bottoms, because there is no heat transfer through the different layers of the bottom and body. The construction according to the invention also has the advantage that the bottom can be obtained with similar means to those used for applying tin plate bottoms. The sealing by means of high frequency on the inside and outside of the bottom is made possible because the metallic barrier foil is located on the inside, i.e. as close as possible to the sealable plastic coverings.

The inventive process has the particular advantage that it can be used not only in the case of circular, but also in the case of non-circular containers with the same advantages and also substantially independently of the wall thickness of the body.

According to an embodiment of the invention the cardboard layer of the bottom can be externally printed, e.g. with a metallic ink and protectively varnished, in order to give the bottom a

metallic appearance and also prevent the penetration of moisture into the cardboard layer as a result of the protective varnish.

According to a further advantageous development, the raised outer rim of the bottom is bent over inwards in the direction of the body, so that the latter is not exposed and is also protected against the access of moisture. A delamination of the composite material at the sectional plane is also avoided.

Finally, according to the invention, the closure facing the bottom can be constructed in the same way as the bottom and can be sealed in the same way as the latter to the body and that further at least in the vicinity of the cardboard layer, the closure is provided with a desired breaking line, which forms the outline of a resealable flap. This embodiment has the advantage that the bottom and the closure are made from the same material and produced with the same cutting tools, whilst being connectable to the body by using the same sealing or covering machines. This embodiment is preferably used for fluid products, which are removed portionwise from the combination container, which can then be constantly reclosed or resealed by means of the flap.

The invention is described in greater detail hereinafter relative to a non-limitative embodiment and the attached drawings, wherein show:

Figure 1 a partial section through an embodiment of the combination container.

Figure 2, a section in the vicinity of the connection of bottom and body in another embodiment.

Figure 3, a section in the vicinity of the connection between closure and body.

Figure 4, a plan view of the embodiment of figure 3.

The combination container shown in the drawings has a body 1 a bottom 2, a closure 3 and, in the construction according to figure 1, a snap cover 4 made from a plastic moulding.

Body 1, which can have a random cross-section (circular or non/ circular) comprises at least one cardboard layer 5, an internally positioned barrier foil 6, e.g. of aluminium and a covering 7 of a sealable plastic placed on the inside thereof. Body 1 is obtained from the aforementioned composite material by spiral or longitudinal winding in a closed form. The sealability on the outside of the body is achieved by using suitable varnishes or coatings.

Bottom 2 has substantially the same construction as body 1. It namely comprises at least one cardboard layer 9, which is internally backed by a metallic barrier foil 10, e.g. of aluminium, which in turn carries a sealable plastic covering 11. On the outside, cardboard layer 9 is advantageously printed with a metallic ink 12. Bottom 2 is deep-drawn from the described composite material, so that it can be inserted in body 1.

In the embodiment according to figure 1, closure 3 is constructed as a membrane closure. It comprises an outer metal foil 13 and an inner covering 14, which is once again made from sealable plastic. In addition, a tear-off tongue 15 is applied to the outside for opening the closure. The closure membrane 3 is also deep-drawn and placed in body 1. The snap cover 4 is used for closing or sealing the container after it has been opened for the first time.

Membrane closure 3 is drawn outwards by its edge or rim 16 over the open end face 17 of body 1 and is fixed to the latter by the hot or high frequency sealing of the plastic covering 14 and covering 7. In this form, the container is supplied to the filling plant, where the filling material or charge is introduced and then the container is closed by bottom 2. For this purpose, the deep drawn bottom 2 with its rim 18 inserted in the body is shaped over the open end face 19 of said body and is applied to the outer circumferential surface thereof. The covering 7 is then sealed to body 1 and covering 11 to bottom 2 by inductive high frequency, so that there is a hermetic, gas, liquid and vapour diffusion-tight closure in the vicinity of the bottom.

In the embodiment according to figure 2, the outer, raised rim 18 of bottom 2 is flanged somewhat inwards, so that its frontal sectional plane 20 presses against the outside of body 1 and is consequently protected. Optionally, the complete rim of bottom 2 engaging over the end face 19 of the body, as well as the actual body can be deformed somewhat in the vicinity of the end face, e.g. the rim can be pressed against the body.

Figure 3 shows an upper closure 2 which, like bottom 2 in figure 1, is made from a cardboard layer 21, an inner metallic barrier foil 22, a plastic covering 23 and an outer protective varnish coating 24. The rim 25 of closure 2 engages over the upper end face 26 of body 1 and is tightly joined therewith by high frequency sealing of the plastic coverings 7 and 23.

Figure 4 is a plan view of the closure 3 according to figure 3 on a smaller scale. In this embodiment, the combination container has a rectangular cross-section with rounded corners 27. In the vicinity of one corner 27, the closure is provided with a triangular desired breaking line 28 which, as intimated in figure 3, is located within the closure rim engaging over the body. Closure 3 can be separated at this desired breaking line 28, so that a type of flap 29 is obtained, which can be closed again following the first opening. The resulting opening, particularly when located in the corner can be used as a filling opening.

CLAIMS

1. A combination container made from composite material, whose body comprises at least one outer cardboard layer, a barrier foil, e.g. of aluminium covering the same on the inside and an inner, sealable plastic covering, whose closure comprises an optionally tear-off layer with an inner, sealable plastic covering and whose deep-drawn bottom to be fitted following the introduction of the charge comprises at least one cardboard layer, a metal barrier foil and a sealable plastic covering placed on the inside, the bottom with its rim being drawn upwards and outwards over the end face of the

body and is sealed on the inside and outside to said body, wherein the metallic barrier foil of the bottom is arranged on the inside of the cardboard layer and is itself provided on the inside with a plastic covering and wherein the bottom is sealed to the body by inductive high frequency.

2. A combination container according to claim 1, wherein the cardboard layer of the bottom is externally printed, e.g. with a metallic ink and is protectively varnished.

3. A combination container according to claims 1 to 2, wherein the raised, outer rim of the bottom is bent over inwards in the direction of the body.

4. A combination container according to one of the claims 1 to 3, wherein the closure facing the bottom is constructed in the same way as the bottom and is sealed in the same way as the latter to the body and wherein at least in the vicinity of the cardboard layer, the closure is provided with a desired breaking line, which forms the outline of a reclosable flap.

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